CATALOGUING AND CLASSIFICATION SYSTEM FOR E-RESOURCES IN WEB-BASED DIGITAL LIBRARIES

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ABSTRACT:

This paper presents an overview of cataloguing and classification process for libraries and analyzes it from the point of view of digital libraries. A case study of Australian Islamic Library's cataloguing process is presented in line with discussions from literature review and key challenges faced by library's patrons. Library's cataloguing method provides ease, flexibility and productivity in assisting users easily find required resources while not becoming a burdon on library staff in terms of its establishment and maintenance. It also addresses most of the improvement opportunities identified by library staff and users.

INTRODUCTION

Library collections house a wide variety of materials on many different topics and in many different formats. The challenge in making these items available for the use of library patrons is letting those patrons know what is in the library collection. A building (or a digital platform such as a website), filled with books and other information resources, is not necessarily a library unless those books and resources have been appropriately organized for access and made conveniently available for use. Libraries use classification and cataloguing systems to organize library materials, including e-resources, so they can be easily and quickly found. 'E-resources' is a description of the plethora of material that is available via a computer and/or the internet. Frequently referred to in the literature today, e-resources include computer files, electronic books and journals, bibliographic databases, and websites (Judy Engall, 2011). In fact, anything that needs a computer or the internet to use it. The scope of this paper would include cataloguing of e-resources for small to medium sized online libraries. With the spiralling evolution of digital technologies and internet-based functionalities, many traditional practices, including current classification and cataloguing methods and procedures, are being open for debate and optimization.

This paper is based on a case study in which catalogue development for Australian Islamic Library is analysed with relevant literature overview. In doing so, we will also analyse some common problems faced by online viewers / readers in accessing relevant material and assess the suitability of proposed solutions (as explained in this paper) in terms of providing a solution to those problems.

SCOPE:

- Our scope includes only those digital libraries which allow reading and downloading of material rather than borrowing or renting digital content.
- Digital libraries operate in various sizes and forms. The scope of this paper will include small to medium sized open access digital libraries.
- The scope does not include very large repositories as their systems are required to handle a massive amount of data and often includes the use of sophisticated algorithms for establishing content relationships which are beyond the scope of discussion in this paper.

Findings from this paper may be considered relevant for application in similar library cataloguing projects.

PROBLEMS FACED BY CUSTOMERS AT DIGITAL LIBRARIES:

Digital libraries add convenience and flexibility over traditional paper-based libraries in many ways. They are free from 'opening and closing hours', 'racking', 'replacement' and 'stocking' etc. However, in order to enhance user experience and utilization, problems faced by users are required to be proactively identified and resolved. Following is an overview of qualitative feedback from the viewpoint of users of online libraries included in the scope of this paper:

- Browsing through the books, in many cases, takes more time then browsing through the bookshelves in physical libraries
- Books at the rear-end of electronic bookshelves (low quartile of webpage) may not be reached by users who decide to quit without seeing the whole bookshelf
- Presenting titles as tiles on page is a good method to provide a quick snapshot of look and feel of book. But this, at the same time, also adds up to loading time resulting in slower loading of web pages
- Search functionality on website is a good method to find a book. However, due to spelling differences and titles of books being in different languages, search-ability gets limited
- Some books may belong to more than one section. It is a good practice to make digital content available in all relevant bookshelves. However, when this is not done or done inadequately, probability of an item being found, when required, reduces.
- Sometimes users only look for books by specific authors. When this information is not readily available to them, it causes them inconvenience.
- If information about 'new arrivals' is not available readily, some users think that the library is not being maintained or updated.
- Libraries which do not maintain meta-data containing brief item description, users find their contents less relevant (even if they are)
- Lack of important meta-data information such as author/ artist, year of publication/ production, publisher etc. results in difficulties in citations
- Not all the readers have same reading interests and level of proficiency in certain subjects. If books are not sorted according to levels, it causes inconvenience leaving users less likely to access desired content.

3 MAIN CATEGORIES OF CONTENT:

Contents (books, multimedia etc.) in libraries are generally divided in three main categories (Nicola Baird, 1994, p. 17), in terms of physical libraries:

- References (Atlases, Dictionaries etc. which are high in demand being used to identify quick facts and are often not for borrowing)
- Fiction
- Information Material (This is sometimes known as non-fiction and is stock about people, places, ideas, concepts and things. Most of the stock in a library, including textbooks, will belong to this group. To help library users find the book they want, it is recommended that the librarian organises all the information stock into different subject areas)

These three categories may not be directly applicable to digital libraries which do not involve borrowing and renting of physical items. Usefulness of classification based on fiction and non-fiction, reference and

information materials will depend on the quantity of material in each class of content and library's goals and objectives.

CATALOGUING AND CLASSIFICATION:

Library classification forms part of the field of library and information science. It goes hand in hand with library cataloguing under the rubric of 'cataloguing and classification', sometimes grouped together as technical services (New World Encyclopedia, 2014).

In very simple words, classification determines the category and belonging of materials, whereas, cataloguing is organization and listing of that information to facilitate browsing and search operation.

The classification systems place items about the same subject in the same area of the library.

The library catalogue might be compared to the index for a book. The index provides the reader with a way to find information in the book without having to read every page. The index tells the reader the page on which the information about a specific subject can be found. The library catalogue does the same thing. It tells the library user exactly where materials meeting their specific needs can be found, with the call number of the book corresponding to the page number in an index. The information contained in the cataloguing record provides the many access points needed by the patron looking for information in the library. Traditionally, the library card catalogue provided access by the author's name, the title of an item, and the subject(s) covered in the item. Other points of access were additional authors, names of series, illustrators, and sometimes the titles of contents.

National Library Australia explains:

"Catalogue records enable users to find and access resources relevant to their needs. They contain a description of a resource that allows it to be identified and distinguished from other similar resources. Catalogue records also contain information that enables users to search for resources through a range of access points, including author and other people or organisations associated with the creation of the work, and through the title, series, subjects and classifications. For physical items, the catalogue record is used to indicate the location of an item in the Library's collection and provides an inventory function"(NLA, 2011).

Anupama Saini (2016) explains following regarding purpose of library catalogues:

- To inform the availability/non availability of a particular reading material in the library.
- To provide information about the entire collection of the library (the catalogue lists all the works of a particular author available in the library collection, all the documents available on a given subject or in a given kind of literature)
- To ensure descriptive cataloguing whenever needed (according to the rules of descriptive cataloguing, the characteristics of the documents are fully described so that one document can be identified and isolated from amongst several similar documents. This type of description is provided in the catalogue entries only in case of need. If the rules of descriptive cataloguing are applied indiscriminately, it would lead to large expenditure)
- Whatever may be the approach of a library user, the library catalogue should convey full information regarding the items of the person's specific interest
- Purpose of a library catalogue is to aid readers in making use of the collection of the library by providing author, subject, title and other approaches to the collection

- A library catalogue is required to serve as a guide to the collection of materials and assists finding relevant work

Two systems commonly used in most libraries, particularly in the US, are the Library of Congress Classification (LC) system, and the Dewey Decimal Classification (DDC) system (New World Encyclopedia, 2014). Both these systems arrange books according to a book's primary subject, and assign each book a unique call number used to locate the book on the shelf (*Finding books inside Galvin Library*, 2016). This method of organizing makes it easier to find books specific to a topic, a field of study or department. With these numbers, physical libraries also manage their lending and stacking operations.

Experienced users may find it easier to search by classification numbers or codes (subject code, year etc.) rather than filling the search form by typing the details embedded in codes separately. However, inexperienced users or those who are not familiar with particular coding system used in a particular library could possibly not use codes very often for searching their desired content.

Classification can be distinguished by type:

(1) natural, or fundamental—e.g., books by subject,

(2) accidental—e.g., chronological or geographic, and

(3) artificial—e.g., by alphabet, linguistic base, form, size, or numerical order.

Degree of classification (e.g., close, with the most minute subdivisions, or broad, with omission of detailed subdivisions) may also characterize a system. Several systems of classification have been developed to provide the type of access and control that a particular library and its clientele need. Generally, each system consists of a scheme that arranges knowledge in terms of stated principles into classes, then divisions and subdivisions (Encyclopedia Britannica, 2016). In the case of Australian Islamic Library, catalogue is customizable by users according to their needs as they can sort it to view 'books by subject', 'chronological order' as well as 'alphabetical' listing of titles/ authors/publishers etc.

Types of catalogues can also be viewed from other perspectives and angles. In bigger libraries there will be several catalogues, including a title catalogue (and perhaps an author catalogue), a subject catalogue and a shelf list. The following description of different types of catalogues is extracted from Nicola Baird's book (1994) on starting and setting up libraries:

Title catalogues: A title catalogue helps readers who are looking for a particular book. This type of catalogue is useful because it is an alphabetical record of the titles of all the stock in the library. It is also assists with continuity of library operations and management of operations during staff leave etc.

Author catalogues: Some librarians recommend making an author catalogue. This is similar to a title catalogue, except that it is an alphabetical record of all the authors represented in the library. The problem is that some publications (especially pamphlets) do not have one obvious author.

Subject catalogues: Subject catalogues help those readers who are searching for books on a particular subject. However, subject catalogues can be complicated as they may need many cross-references to other subjects and titles.

Preference for these different types of catalogues varies. According to a research, results point out to a strong preference by users for searching by title (49%), followed by searches by author (37%), and finally, by subject search (14%) (Villen-Rueda, Senso, & de Moya-Anegón, 2007). However, these results would vary from medium to medium, subject to subject and location to location, as indicated by Birger Hjørland (2010) who expresses a need for further research in this area. We expect students searching for particular textbooks would come to library catalogue with specific titles. However, if they are looking for supporting material, sharhs (Arabic word for 'explanation') and guides, they are highly likely to search by keywords. Keywords is a way of working for many to find relevant material from repositories (such as Google Scholar, Google Books, Archive.org, Slideshare etc.). Library of Congress mentions:

"It is often possible to identify a long-lost novel by going to an Internet search engine and searching on key elements of the book's plot, characters' names, and other remembered in-text details. For example, someone looking for an old fantasy novel featuring a character named Bink can search Google using the string *bink "fantasy novel"* and receive numerous references to the correct title" (LOC, 2015).

With current technological development, it is not difficult to produce three different types of catalogues mentioned above in single digital catalogue utilizing databases which can present information based on how users wish to see it. This strategy is deployed in Australian Islamic Library's catalogue as well.

The information contained in a cataloguing record, whether on the computer or on a card, can be separated into three different areas: bibliographic information, subject headings and other access points, and call numbers. The bibliographic information needed in a cataloguing record is found and entered into that record according to cataloguing rules and guidelines which are created and practiced in an an effort to create a standard of information that will enable both library staff and patrons to find the information that they need in any library worldwide. Because the information is listed in the same order and style in cataloguing records, the language or format of the item are not barriers to being able to find out what is the title, author, publisher or another piece of bibliographic data. Punctuation is used to set different categories of information apart from each other. This can be interpreted by the computer catalogue program to indicate areas to be searched when looking up information. However, there has been a debate in recent times regarding effectiveness for various classification and cataloguing standards with a need for better accommodation of digital environments.

Dewey Decimal Classification:

This system assigns number ranges to various subject areas. Using this system can result in some ranges to remain unused due to lack of availability of books or media related to those subject categories.

For this reason, not all librarians think Dewey is the best classification system for schools. If a library has only a few books, the shelves can look rather odd, with unclear subject links between neighbouring books. Some teacher-librarians also say that students find Dewey hard to understand. Librarians need to think about students' needs and how easy it will be for them to find the information they want. In general, Dewey is a useful classification system, but adaptations are recommended to enhance usability (Nicola Baird, 1994, p. 32).

Library of Congress Classification:

In 1899, the United States Library of Congress created a classification scheme for books. It is called the Library of Congress Classification system (LC for short). In this system, all knowledge is divided into 21 broad subject areas by letters of the alphabet (I, O, W, X, and Y are not used). These subject areas (denoted by letters) are further sub-divided by adding a second letter to show the particular branch of a subject. For example, G denotes geography in general whereas GA refers to mathematical geography. These branches or subjects are then further sub-divided into topics using numbers. This combination of subject areas (letters) and numbers is called the call number for that book. This classification system also allows mentioning a particular collection as a few coded letters at the beginning of call number (Gerald R. Sherratt Library, 2014).

ONLINE LIBRARY CATALOGUE:

In the current section of our paper, we will analyse the classification and cataloguing of digital content at Australian Islamic Library.

Classification:

Hjørland presents a very relevant finding in his lecture and subsequent paper: "At the practical level, libraries are increasingly dispensing with classifying books. At the theoretical level, many researchers, managers, and users believe that the activity of 'classification' is not worth the effort, as search engines can be improved without the heavy cost of providing metadata" (Birger Hjørland, 2010).

This is even more relevant in the case of digital libraries operating through online platforms, as search engines have simplified the task of finding books. However, as highlighted in the section dealing with problems faced by online readers/ viewers, differences in spellings and titles being in different languages (in addition to other issues) contribute to users not being able to find required content. Therefore, it is important to assign a 'subject area' to content. However, the numbering of each book may not be very relevant in line with experiences and observations in the case of Australian Islamic Library. Similarly, it is considered appropriate to use 'strings' in the classification of content rather than numbers as users find it easy to search various content classes alphabetically sorted out for them.

Australian Islamic Library is has finalized its cataloguing mechanism, built the structure and commenced original entries at the time this paper is being written. Library intends to provide classification information (strings rather than number codes) in its catalogue (rather than mentioning it on individual books, like traditional libraries, as no lending, racking or de-racking operations are involved in the case of digital contents).

Cataloguing:

In terms of cataloguing, following are included in the main entry for each item:

- Title of book
- Classification – Subject area (e.g. Fiqh) and sub-Category (Fiqh of Taharah etc.)
- Author
- Year of publication
- Language
- Abstract
- Publisher

- ISBN
- Date of Addition
- Edition
- Pages
- Flag for new arrival (books uploaded within last six months)
- Location (Link for reading/ downloading/ listening/ watching the file)

Implementation:

The objective of cataloguing activity is to enable search of relevant content from the catalogue in an optimized manner while saving search-time. There can be a number of various approaches adopted to achieve this purpose which may range from simple free-ware solutions to super high-tech systems. Australian Islamic Library has adopted the following approach which is found to be effective from resource requirement point of view:

- An catalogue was created in an excel spread-sheet containing required fields as explained above under 'cataloguing'
- This spreadsheet was hosted on Google drive and published online (so that it can be accessed through a url)
- Worksheet will be updated as new books get added to library and as the cataloguing activity goes ahead further
- *'Awesome table'* app was used to create retrieval system search fields. Relevant filters were mentioned in the catalogue in second row (as per the usage instructions) - *an explanation of various filters used in the process is also explained in this section*
- Awesome table app was accessed through awesome-table.com and table was configured using the url for spreadsheet and other relevant information (preview shown in figure below)
- Html code was copied and pasted in catalogue website for users to access and utilize

Awesome table is an app which allows application of certain filters and optimizes overview with appropriate layout to facilitate search capability. It is usable with Google-sites as well as a stand-alone feature for HTML.

Following filters have been applied in Australian Islamic Library catalogue:

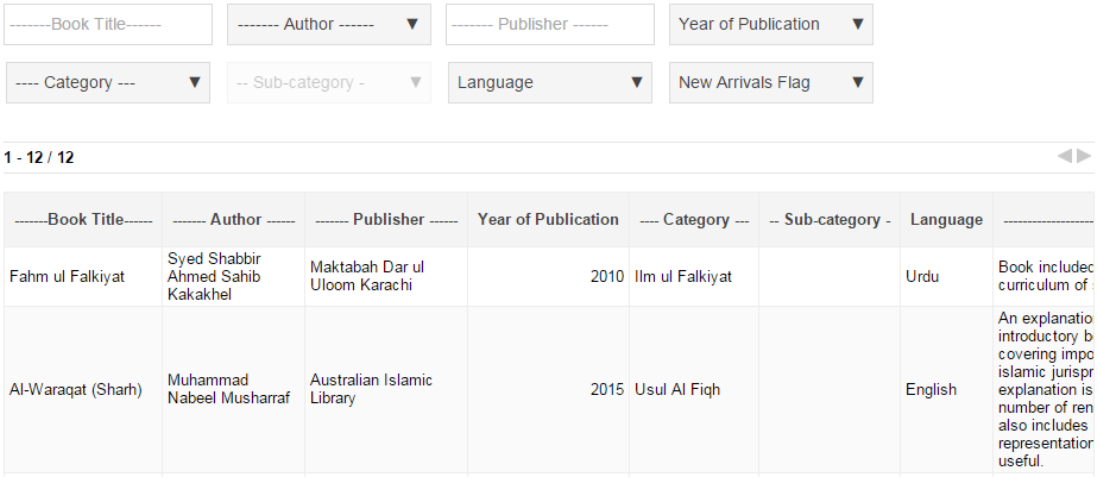
StringFilter: Helps find a string within text of a cell (e.g. search for certain keyword within book titles or authors etc.)

CategoryFilter: Helps find values belonging to a particular category (e.g. Fiqh, Arabic Language etc.)

csvFilter: Helps find values within cells separated by commas (e.g. multiple authors for a single book or multiple subject areas for a single book etc. can be dealt with using this filter etc.)

NoFilter: Awesome tables picks certain values directly as a variable to be filtered (e.g. page numbers etc.). If we do not wish that to be made available to users, we use this filter.

Based on above, Australian Islamic Library has prepared the following interface for its catalogue:



-------Book Title------ | ------- Author ------ | ------- Publisher ------ | Year of Publication
---- Category --- | -- Sub-category - | Language | New Arrivals Flag

1 - 12 / 12

-------Book Title------	------- Author ------	------- Publisher ------	Year of Publication	---- Category ---	-- Sub-category -	Language	----------
Fahm ul Falkiyat	Syed Shabbir Ahmed Sahib Kakakhel	Maktabah Dar ul Uloom Karachi	2010	Ilm ul Falkiyat		Urdu	Book includec curriculum of
Al-Waraqat (Sharh)	Muhammad Nabeel Musharraf	Australian Islamic Library	2015	Usul Al Fiqh		English	An explanatio introductory b covering impo islamic jurispr explanation is number of ren also includes representatior useful.

Figure: A snapshot of Australian Islamic Library's Online Catalogue

Note: Above snapshot does not provide an overview of complete main entry as they require more visual space for display.

SOME IMPORTANT POINTS REGARDING SELECTED CATALOGUING MECHANISM:

Level of Cataloguing:

While populating and maintaining this catalogue, Library may choose the level of detail for cataloguing various items in its collection according to its preference based on available information, resources and user requirements.

Dr. Sarika Siddharth Sawant mentions:

"Libraries may choose to catalog some materials at full level and others at minimal, based on staffing, expertise (subject, language, format), cost, or any other criteria. For most libraries, it is not economically feasible to catalog everything at full level. Catalogers are constantly balancing the need to meet the goals of Description and Access with the cost of cataloging" (Sarika Sawant, 2012).

Main and Added Entries:

It is important to note that in preparing catalogue with this mechanism, only 'Main Entry' will be required for most library items and there will be no need for added entries, as users with various needs will all be able to search relevant content through search features provided in this dynamic view of library catalogue which can serve as author catalogue, subject catalogue, dictionary catalogue etc. all at the same time.

AACR-2 defines a Main Entry as "The complete catalogue record of an item, presented in the form by which the entry is to be uniformly identified and cited".

AACR-2 gives a simple definition for 'Added Entry'. It says an added entry is "An entry, additional to the main entry, by which an item is represented in a catalogue; a 'secondary entry".

However, in the case of books/ multimedia/ graphics in languages other than English, entries for alternate spellings or names in other languages will be made to facilitate search operation without duplicate entries. For retrieving such items, StringFilter will be employed.

Library has reviewed the challenges presented by Ismail, Yaakub, & Napiah (2015) in relation to cataloguing Arabic books and believes and filtering, sorting and retrieval approach being implemented in its catalogue will assist in overcoming those challenges to a considerable extent.

Type of Catalogue:

As explained before, users can identify an item from Australian Islamic Library's catalogue based on their preferred way of accessing catalogues. Due to sorting and filtering mechanisms implemented, it can act as a subject, author or title catalogue depending on user choice.

SOLUTION TO PROBLEMS FACED BY USERS WITH PROPOSED CATALOGUE DESIGN:

Issues faced by users mentioned earlier on in this paper are reviewed below to assess if proposed mechanism would be able to provide an adequate solution or not.

- Browsing through the books, in many cases, takes more time then browsing through the bookshelves in physical libraries

  The proposed design would solve this problem as catalogue would be downloadable and users can sort it by author, publisher, subject or title to suit their needs. Users would also be able to filter for specific subjects and be able to browse large amount of titles in a short amount of time

- Books at the rear-end of electronic bookshelves (low quartile of webpage) may not be reached by users who decide to quit without seeing the whole bookshelf

  Display of books in catalogue take lesser visual space as compared to tiled display on library bookshelf webpage and accordingly solve this issue. However, it would not be as attractive and inviting for reading as the display on webpage. This would mean continued relevance of web-based display in addition to the catalogue (which also provides 'Read' and 'Download' links).

- Presenting titles as tiles on the webpage is a good method to provide a quick snapshot of look and feel of the book. But this, at the same time, also adds up to loading time resulting in slower loading of web pages

  This catalogue is a text only file and accordingly takes the significantly lesser time to load.

- Search functionality on the website is a good method to find a book. However, due to spelling differences and titles of books being in different languages, search-ability gets limited

  In the main entry for different items in the catalogue, different spellings can be entered. We can also enter titles or authors' names in other languages (without a need for additional entries or duplications). They can be searched as well. The Same functionality can also be achieved through meta-data management on the website but that approach requires a significantly higher amount of time and can possibly be considered a negative action by indexing websites such as Google.

- Some books may belong to more than one section. It is a good practice to make digital content available in all relevant bookshelves. However, when this is not done or done inadequately, the probability of an item being found, when required, reduces.

  In each main entry, additional bookshelves can be mentioned separated by commas. These would be searchable by csvFilter in the catalogue with no need for duplicate entries.

- Sometimes users only look for books by specific authors. When this information is not readily available to them, it causes them inconvenience.

  Search by a particular author is facilitated through StringFilter in the catalogue. The Same functionality is achievable with regards to publishers and titles.

- If information about 'new arrivals' is not available readily, some users think that the library is not being maintained or updated.

  A flag has been added for new arrivals which gets updated automatically. As the catalogue spreadsheet is updated on google drive, the formula for new arrivals puts a flag. Due to the following formula, this flag gets removed after a time period which can be set by library management:

  =IF(L4>(TODAY()-90),"New Arrival","")

  // L4 is the cell which contains 'date of addition' of a particular content to library

- Libraries which do not maintain meta-data containing brief item description, users find their contents less relevant (even if they are)

  As only the titles do not explain what a book or multimedia is about, a brief description is necessary. Due to limitation of time and visual space, it is not always possible with currently library web page configuration. However, to overcome this issue, a column has been added in library catalogue to display abstract.

- Lack of important meta-data information such as author/ artist, year of publication/ production, publisher etc. results in difficulties in citations

  This information is available in library catalogue.

- Not all the readers have same reading interests and level of proficiency in certain subjects. If books are not sorted according to levels, it causes inconvenience leaving users less likely to access desired content.

  This aspect is not covered so far in the catalogue due to time limitation. However, library will consider this aspect in future to facilitate users.

CONCLUSION:

This paper established an effective, affordable and productive cataloguing mechanism for small to medium sized libraries which provides powerful search and retrieval functionality. Identified mechanism was assessed to check if it provides a solution to common problems faced by viewers of open-access digital

libraries. Findings indicate that functionality incorporated solves most of the problems and provides an effective system for browsing, management and retrieval of contents.

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